

CLAUDE BERNARD

A Great Physiologist

Claude Bernard, Physiologist. By J. M. D. Olmsted, M.D. With a foreword by Dr. Alexis Carrell. (Cassell. 15s.)

By SIR GEORGE NEWMAN

It is forty years since Sir Michael Foster wrote his admirable biography of Claude Bernard, the first authoritative account of his life published in English. Since then appreciation of Bernard's epoch-making work has vastly extended in all nations, because it has so closely affected them. For many years after his death in 1878 he was recognised as the greatest physiologist of modern France, but more recently the ripe fruit of his discoveries has been gathered in the science of physiology, in the art of healing, and, above all, in constructive preventive medicine. It is this fact that makes particularly opportune and timely this new and highly competent interpretation of the genius of Claude Bernard. Professor Olmsted, of California University, himself an eminent physiologist, has not only availed himself of further records, such as Madame Raffalovich's letters to Bernard, hitherto neglected by his biographers, but he is fortunate in the occasion of his erudite literary study which coincides with the astonishing results of Bernard's work in our own times.

Son of a Peasant

What sort of man was this, and what did he actually achieve? He was the son of a peasant vinegrower and wine-maker at Saint Julien, Villefranche, near Lyons, and was born in 1813. He was schooled at home and the Jesuit College, apprenticed to a local chemist, and addicted to amateur poetry and drama. Subsequently, he became a medical student in Paris, and *preparateur* to Professor Magendie at the College of France. He married the daughter of a local practitioner (from whom he was afterwards separated) and his domestic life was unhappy and estranged. Accordingly he devoted himself wholly to his laboratory duties and to assisting his master in experimental research and studying for his doctorate, which he acquired at the age of thirty.

Dr. Alexis Carrell says in his foreword that Claude Bernard's life teaches us three valuable lessons. First, that greatness may spring from nowhere. Pasteur and Bernard came from obscure stock of French peasants, frugal, religious, strong, hardworking men and women. Secondly, that unploughed fields sometimes yield a rich harvest. Neither of them had the preliminary advantage of cultured homes of learning. Thirdly, both logic and intuition are essential qualities of the discoverer. It may be recalled that in the eighteenth century the great John Hunter advised Edward Jenner, "Don't think, try"; this was followed in the nineteenth by Claude Bernard's aphorism, "Why think, when you can experiment? Exhaust experiment and then think."

Four Discoveries

Bernard began to make his way professionally as co-operator in the experimental researches of the great Magendie, whom he succeeded as professor in 1855. Not brilliant as a lecturer, he became pre-eminent as an experimentalist, accomplishing the major part of his lasting contribution to physiology between 1846 and 1857. This consisted in brief of four particular discoveries, leading up to one great synthetic generalisation, the discoveries themselves being inter-related. The first, in 1846, threw light on the digestive action of the pancreatic juice on fats as well as carbohydrates and proteins; the second proved, in 1848, that the liver, in addition to secreting bile, also

produced an internal secretion, a sugar-forming substance, glycogen; the third discovery, in 1851, was that of the existence of a vaso-motor system of nerves controlling the muscle walls of the blood vessels; and the fourth (1856) was a series of new facts concerning the action of certain poisons in the body, particularly curare and carbon monoxide. Now it was upon these four findings that the genius of Bernard, contrary to his usual practice, formulated a remarkable synthetic generalisation—what used to be called "a law"—that all vital mechanisms of the body, physical or chemical, varied as they are, have one main objective, namely, "the preservation of the constancy of the internal environment of the body."

Thus it has come about that when we seek to summarise the scientific achievements of Claude Bernard, material experimentalist, we cannot satisfy ourselves with a mere catalogue of apparently isolated medical discoveries however severally important in themselves. We have to consider the total meaning of his contribution to our knowledge of digestion, of the nervous control of the arteries, and of his opening of the door to the vast new sphere of internal secretion, the so-called endocrinology of our own time. What we have to understand is that this man introduced *methods of science* by the experimental study of Medicine and its healing art, that he formulated new *principles* of nutrition, nervous control, and internal secretion, and that out of these methods and principles he evolved a new vital synthesis, which visualised the constancy of the internal environment of the body as the governing condition of its life and capacity.

The Science of Life

Bernard's *method* of work, illustrated in all his investigations, was of the simplest, and is applicable, in their own sphere, by all thinkers and workers; find and observe the facts of natural phenomena; let these give birth to an idea, or hypothesis, in the mind, partly by intuition, partly by imagination; check the idea by reasoning, observation, and experiment; gauge its results, and devise new experiments to verify the new phenomena. Though Bernard was the leading genius in introducing this method into modern medicine, its application has been both wide and varied. So much so, that in various fields of work it has changed the entire outlook. For instance, we have had to re-orient our conception of the actual basis of individual and national health. From Darwin's epoch we had to reevaluate the effect on health and capacity of the *external* environment and domestic surroundings of the people. From Bernard's epoch we have had to learn a deeper truth, namely, that still more effectual in creating and maintaining personal and national health is the vitality and constancy of the *internal* environment of the body itself, its blood, its internal secretions, its normal physiological balance. "It is in the study of these inner organic conditions," said he, "that direct and true explanations are to be found for life and health, for sickness and death." Thus, it is this new interpretation, practised through the public health services—through improved nutrition, rest, exercise of the whole body, and abundant fresh air—which is profoundly changing for the better the health and capacity of nations and of the individuals composing them. "Medicine," said Bernard, "is the science of sickness and of healing, physiology is the science of life."

ASMS OR OSTS?

General Collections

Survey of Evidence. By Sir Ernest Bennett

ND MacCARTHY

however is seldom convincing, since it is precisely in making such assertions that people are particularly careless. Haunted houses have proved as a rule a great disappointment to investigators. I know not why, but always I have found that it is so; that when the glum researchers come the brutes of bogeys—go.

Was He Really Dead?

Case 46 is a curious story with a probable explanation. A Mr. W. H. Stone, a leather factor in Hopstow, was leaving his office at half-past one, meditating on his bets for the coming St. Leger, when he saw an old one-armed publican he had known when he used as a youth to collect money from publicans. There this publican stood in his rather old-fashioned, sporting clothes, and with that iron hook protruding from his sleeve which he used to find so useful in clearing quarrelsome customers out of his bar. His face at once lit up when he saw Mr. Stone, who greeted him with pleasure, knowing that he was just the man with whom to talk over racing-odds and horses. They had a chat on the pavement, and Mr. Stone made a note of one or two pieces of information the old man gave him. Then, shaking him a second time warmly by the left hand, he went about his own business.

As I got to the same part of P Street on my way back, I suddenly stood still, my whole body shook, and for the moment I tried to reason with myself. The man I had been speaking to was dead some four years before! . . . I certainly saw his funeral. . . . I felt a cold shiver come over me, although the day was warm; the hair of my head seemed as if it would force off my hat; my very blood seemed to object to perform its duty. . . . Was it really a vision of the departed? Let the reader judge for himself. I give it up. Had I been deceived in having met the man? No such thing. Then was it someone very like him? Nothing of the sort, for the very words that passed between us could come from no other lips. . . . Was it an optical delusion? . . . Certainly not; we sometimes believe we see what we do not see, but in this case it was nothing of the sort, nor could it be somebody like him, it was him! As I said before, he had but one hand. . . . I had had business transactions with him for many years.

Well? The explanation is that Mr. Stone was not mistaken about the publican's identity, but about his death. He had been misinformed about that funeral which he says he saw—mark, he does not even say he attended it.

one. The latter instances (always supposing thought-transference to be the correct explanation) would be extremely important indications of survival after death. The desire to find evidence for that is, of course, the main root of our interest in such phenomena. But in themselves, considered as stories of the supernatural, few are striking; although there is a flatness or pointlessness about them which is sometimes intriguing, and is certainly a guarantee of good faith on the part of the narrators. Instances of purposeful apparitions are rare; of a ghost or thought-body of someone appearing in order to comfort or warn another. There is one story in this book where a man's father appeared to him and warned him against embarking on some rather shady transaction: this ghost talked and also obscured the light in the bedroom whenever it passed in front of it. The "case," however, struck me as one of the least convincing.

A COTTAGE IN THE COUNTRY

Calling for a Spade. By Richard Church.
(Dent. 7s. 6d.)

By JULIAN TENNYSON

This delightful book owes its existence to a fifteenth-century cottage in north-west Essex, which Mr. Church made his country home for six years.

Essex, where it adjoins Cambridge-shire, is still remote and primitive, and until the Government made an aerodrome nearby the cottage stood much as it had stood in the year when it was built. Mr. Church's connection with it was a long struggle—or series of struggles—with the birds which had honey-combed the forty-year-old thatch, with the leaks and cracks which four centuries had developed in the fabric, with the ferocious tangle of weed and bush which had submerged the garden "with its tangle of nettle, bindweed, charlock, thistle and cow-parsley, and its substratum of old sauce bottles, broken bedsteads, bicycle frames, salmon tins and all the rest of the detritus of impoverished cottage life."

The new owner wisely decided to carry on the battle entirely with the aid of local forces—not calling in the help of "foreigners," as all who live more than five miles from the village are considered.

Step by Step

The re-thatching of the roof, the digging of a well, the dredging of a pond, such were the main engagements in the campaign. All are described by Mr. Church with a poet's sensibility to detail and an artist's power to control it.

It is rare to find a writer who combines feeling for the right word and the right phrase with such a simplicity and directness of attack. As a result his book, though made up of a number of separate essays and sketches, has a unity and sequence which lead the reader through delightedly from cover to cover.

The end of the story is tragic enough. Three hundred acres of an adjoining farm are compulsorily acquired by the Air Ministry, a small army of Irish navvies arrive and are augmented by all the unemployed of the neighbourhood and agricultural labourers lured from their normal work by higher wages—great foundations spread and hangars arise. "For months these iron skeletons grew, horrible museum pieces, bad dreams of the Pleistocene age." Then comes "a mushroom town, with a network of concrete roadlets, lit by naked lamps on poles . . . and general chaos rampant, 'where late the sweet birds' . . ."

The last chapter shows Mr. Church courageously facing the creation of a "Garden of Eden" in the west in a long deep valley somewhere in the Mas Hardy country. Let us hope that this enterprise will be as successful as the first, recorded in as charming a



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Sometimes this influence (if such it be) would seem to pass between two